

Angela M. Detweiler

Angela.M.Detweiler@nasa.gov
650-604-0525

NASA Ames Research Center
Exobiology Branch
Mail Stop 239-4, P.O. Box 1
Moffett Field, CA 94035

PROFESSIONAL EXPERIENCE

- 2009-pres. **Microbial Ecology & Biogeochemistry Research Laboratory, Exobiology Branch, NASA Ames Research Center - Moffett Field, CA**
Research Associate
Conduct research across the fields of Astrobiology, Space Exploration and Renewable Energy. Perform molecular biology techniques (PCR, DNA and RNA isolations, cDNA synthesis and cloning) on environmental samples to assess microbial diversity and community shifts under different conditions/manipulations. Perform biochemical assays to assess ecosystem functioning (C, N, O, & H cycling) in microbial communities. Develop protocols and assays. Maintain culture collection. Contribute to scientific publications and presentations. Coordinate experiments and data exchange with collaborators. Manage daily lab operations, instrumentation and purchasing. Supervise and mentor interns.
- 2012-2013 **Thin-film Optoelectronics Lab, Department of Physics, University of California Santa Cruz - Santa Cruz, CA**
Associate Specialist
Assessed growth rates and photosynthetic efficiency of various algal strains under wavelength selective luminescent solar concentrator panels developed by Dr. Sue Carter's research group.
- 2008-2009 **TransDerm Inc. - Santa Cruz, CA**
Laboratory Assistant
Worked on the development of topical delivery methods of siRNA to inhibit the skin disorder pachyonychia congenita. Performed molecular biology techniques (PCR, cloning, DNA and RNA isolations). Managed grants, budgeting, and purchasing of laboratory equipment.
- 2006 **University of Wyoming**
Jan-Mar **Field Research Assistant**
Conducted field and laboratory work in Andean Piedmont streams in Venezuela to examine the role of a migratory fish on riverine ecosystem processes. Performed ecosystem metabolism measurements, nitrogen fixation and denitrification experiments, stream and groundwater chemistry analyses, fish density estimates, and otolith extractions.

TEACHING EXPERIENCE

- 2006-2008 **Department of Biology, UNCG - Greensboro, NC**
Lecturer
Developed and taught introductory biology lecture courses for classes up to 110 students. Instructed anatomy and introductory biology laboratory courses.
- 2004-2005 **Department of Biology, UNCG - Greensboro, NC**
Graduate Teaching Assistant
Instructed general biology laboratory courses for majors and non-majors.

EDUCATION

- M.S. **The University of North Carolina at Greensboro**
2005 Master of Science in Biology. Advisor: Anne E. Hershey
- B.S. **Appalachian State University**
2001 Bachelor of Science in Ecology & Environmental Biology. Advisor: Ray S. Williams

HONORS AND AWARDS

- 2014 NASA Ames Group Achievement Award – Planetary Lake Lander Team
- 2012 NASA Ames Contractor Employee Honor Award
- 2012 NASA Group Achievement Award – Ames Railroad Valley Experiment 2011 Team
- 2011 NASA Ames Group Achievement Award – Ames Railroad Valley Experiment 2011 Team
- 2010 NASA Ames Group Award – Yuri's Night and Education Day Team
- 2005 Summer Assistantship Award, Graduate School, UNCG
- 2005 Phyllis Penn Kohler and Biology Department Award, UNCG

SERVICE AND LEADERSHIP

2007-2009 **Student Conservation Association** **Alumni Council Member**

Co-drafted a mission plan for SCA's newly formed alumni council. Organized SCA alumni gatherings in North Carolina and California, recruited students for internships, and served as an advisor for the non-profit organization. Panel moderator for SCA's Earth Vision Summit held in Washington D.C in April of 2008.

2008 & 2009 **Cinema Nosso - Rio de Janeiro, RJ, Brazil** **Instructor**

Co-instructed a workshop on the film editing software *Final Cut Pro* for urban youth at the non-profit organization Cinema Nosso during the summers of 2008 & 2009. Workshop included hands-on technical activities covering the basics in film editing as well as film editing history and theory.

2007 & 2008 **Science Olympiad, UNCG - Greensboro, NC** **Event Leader**

Developed and led two events during the 2007 & 2008 North Carolina Science Olympiad tournament hosted by the Department of Biology at UNCG.

2005-2007 **Department of Biology, UNCG - Greensboro, NC** **Science Instructor**

Developed and instructed laboratory activities for the 1st, 2nd & 3rd Annual Science Friday program hosted by the Department of Biology in conjunction with the All-Arts & Sciences Camp for middle school ESL students interested in pursuing a future degree in science.

PUBLICATIONS

1. Everroad R.C., R. Stuart, B. Bebout, **A. Detweiler**, J. Lee, D. Woebken, L. Prufert-Bebout, J. Pett-Ridge. Permanent draft genome of strain ESFC-1: Ecological genomics of a newly discovered lineage of filamentous diazotrophic cyanobacteria. *Standards in Genomic Sciences* (in review)
2. McKay C.P., J.C. Rask, **A.M. Detweiler**, B.M. Bebout, R.C. Everroad, J.Z. Lee, J.P. Chanton, M.H. Mayer, A.A.L. Caraballo, B. Kapili, M. Al-Awar, A. Al-Farraj (2016). An unusual inverted saline microbial mat community in an interdune sabkha in the Rub' al Khali (the Empty Quarter), United Arab Emirates: PLoS ONE 11(3): e0150342. DOI:10.1371/journal.pone.0150342
3. de-Bashan L., X. Mayali, B.M. Bebout, P.K. Weber, **A.M. Detweiler**, J.P. Hernandez, L. Prufert-Bebout, Y. Bashan (2016). Establishment of stable synthetic mutualism without co-evolution between microalgae and bacteria demonstrated by mutual transfer of metabolites (NanoSIMS isotopic imaging) and persistent physical association (Fluorescent in situ hybridization). *Algal Research* 15, 179-186. DOI:10.1016/j.algal.2016.02.019
4. Murphy T.E., B.K. Kapili, **A.M. Detweiler**, B.M. Bebout, L.E. Prufert-Bebout (2015). Vertical distribution of algal productivity in open pond raceways. *Algal Research* 11, 334-342. DOI: 10.1016/j.algal.2015.07.003
5. **Detweiler, A.M.**, C.E. Mioni, K.L. Hellier, J.J. Allen, S.A. Carter, B.M. Bebout, E.D. Fleming, C. Corrado, L.E. Prufert-Bebout (2015). Evaluation of wavelength selective photovoltaic panels on microalgae growth and photosynthetic efficiency. *Algal Research* 9, 170-177. DOI 10.1016/j.algal.2015.03.003

6. Kelley, C.A., B.E. Nicholson, C.S. Beaudoin, **A.M. Detweiler**, B.M. Bebout (2014). Trimethylamine and organic matter additions reverse substrate limitation effects on the d13C values of methane produced in hypersaline microbial mats. *Applied and Environmental Microbiology* 80 (23), 7316-7323. DOI 10.1128/AEM.02641-14
7. **Detweiler, A.M.**, B.M. Bebout, A.E. Frisbee, C.A. Kelley, J.P. Chanton, L.E. Prufert-Bebout (2014). Characterization of methane flux from photosynthetic oxidation ponds in a wastewater treatment plant. *Water Science and Technology* 70 (6), 980-989. DOI 10.2166/wst.2014.317
8. Everroad, R.C., D. Woebken, S.W. Singer, L.C. Burrow, N. Kyrpides, T. Woyke, L. Goodwin, **A. Detweiler**, L. Prufert-Bebout, J. Pett-Ridge (2013). Draft genome sequence of an oscillatorian cyanobacterium, strain ESFC-1. *Genome Announcements* 1(4):e00527-13. DOI:10.1128/genomeA.00527-13
9. Yates, E.L., **A.M. Detweiler**, L.T. Iraci, B.M. Bebout, C.P. McKay, K. Schiro, E.J. Sheffner, C.A. Kelley, J.M. Tadic, and M. Loewenstein (2012). Assessing the role of alkaline soils on the carbon cycle at a playa site. *Environmental Earth Sciences* 70, 1047-1056. DOI 10.1007/s12665-012-2194-x
10. Hsu, W., A. Kuss, T. Ketron, A. Nguyen, A. Remar, M. Newcomer, E. Fleming, L. Bebout, B. Bebout, **A. Detweiler**, J.W. Skiles (2011). Hyperspectral biofilm classification analysis for carrying capacity of migratory birds in the South Bay salt ponds. *Proceedings of the American Society for Photogrammetry and Remote Sensing*

SELECTED CONFERENCE PRESENTATIONS

1. **Detweiler, A.M.**, C.P. McKay, J. Rask, R.C. Everroad, J.P. Chanton, C.A. Kelley, J.Z. Lee, M.H. Mayer, A.A.L. Caraballo, B. Kapili, M. Al-Awar, A. Al-Farraj, J.Q. Garcia-Maldonado, B.M. Bebout. Hypersaline environments as analogs for habitats on past Mars. Space Science and Astrobiology Jamboree 2016, NASA Ames Research Center, Moffett Field, CA, 8 Mar. Poster (presenter)
2. Bebout, B., L. Bebout, **A. Detweiler**, R. Everroad, J. Lee, J. Pett-Ridge, P. Weber. Studying microbial mat functioning amidst "unexpected diversity": methodological approaches and initial results from metatranscriptomes of mats over diel cycles, iTags from long term manipulations, and biogeochemical cycling in simplified microbial mats constructed from cultures. Abstract B13J-02 presented at 2014 Fall Meeting, AGU, San Francisco, CA, 15-19 Dec. Talk (co-author)
3. Everroad, C., B. Bebout, L. Bebout, **A. Detweiler**, J. Lee, X. Mayali, S. Singer, R. Stuart, P. Weber, D. Woebken, J. Pett-Ridge. Ecological genomics of the newly discovered diazotrophic filamentous cyanobacterium ESFC-1. Abstract B23A-0194 presented at 2014 Fall Meeting, AGU, San Francisco, CA, 15-19 Dec. Poster (co-author)
4. Lee, J., **A. Detweiler**, R. Everroad, L. Bebout, P. Weber, J. Pett-Ridge, B. Bebout. Diel metagenomics and metatranscriptomics of Elkhorn Slough hypersaline microbial mat. Abstract B13J-03 presented at 2014 Fall Meeting, AGU, San Francisco, CA, 15-19 Dec. Poster (co-author)
5. Lee, J.Z., R.C. Everroad, **A.M. Detweiler**, M.D. Kubo, P.K. Weber, J. Pett-Ridge, L. Prufert-Bebout, T.M. Hoehler, B.M. Bebout. Deconstructing biohydrogen production and biogeochemical cycling from hypersaline microbial mats. ASM May 17-20, 2014, Boston, MA. Poster (co-author)
6. **Detweiler, A.M.**, C.E. Mioni, J.J. Allen, K.L. Hellier, S.A. Carter, G. Alers, B.M. Bebout, E.E. Fleming, C. Corrado, L.E. Prufert-Bebout. Evaluation of wavelength selective photovoltaic panels on microalgae growth and photosynthetic efficiency. Algal Biomass Organization Summit. Sept. 30-Oct. 3, 2013. Orlando, FL. Poster (presenter)
7. Cabrol N.A., E.A. Grin, C. Haberle, J.E. Moersch, R.E. Jacobsen, R. Sommaruga, E.D. Fleming, **A.M. Detweiler**, A. Echeverria, Y. Blanco, L.A. Rivas, L. Pedersen, T. Smith, D.S. Wettergreen, C. Demergasso, V. Parro, T. Fong, G. Chong, L. Bebout. Planetary lake lander: using technology relevant to Titan's exploration to investigate the impact of deglaciation on past and present planetary lakes. Abstract submitted to the 43rd Lunar and Planetary Science Conference, 2012. Poster (co-author)

8. **Detweiler, A.M.**, C.A. Kelley, B.M. Bebout, C.P. McKay, J. DeMarines, E.L. Yates, L.T. Iraci . Ground truthing for methane hotspots at Railroad Valley, NV – application to Mars. Abstract B51G-0486 presented at 2011 Fall Meeting, AGU, San Francisco, CA, 5-9 Dec. Poster (presenter)

HARDWARE

DX-120 ion chromatograph, LICOR quantum sensor (LI-190SA)/LI-1400 datalogger, Microphot MXA and Nikon SMZ-10A microscopes, Ocean Optics USB 4000 VS-NIR spectrometer, Peltier thermocycler PTC-200, Pyroscience optical oxygen meter–FireStingO₂ FSO2-1, QUBIT fluorometer, BIO-RAD Experion automated electrophoresis system, RGA3 reduction gas analyzer, Shimadzu 14A and Mini-2 gas chromatographs, SpectraMax M5 microplate reader, Telumen LED light replicator, Thermo Scientific NanoDrop 2000 spectrophotometer, Unisense Picoammeter PA 2000, UV-1800 Shimadzu spectrophotometer, WALZ diving pulse amplitude modulated (PAM) fluorometer, Walz Imaging PAM M-series, YSI 6920 and 6600 V2 sondes

SOFTWARE

Geneious, MEGA, Mallard, SILVA, MOTHUR, Clustal X, OriginLab, Statistical Analysis System (SAS), EZChrom Elite, Adobe Illustrator, Microsoft Office, Final Cut Pro, ArcGIS

PROFESSIONAL SOCIETIES

American Geophysical Union
Algae Biomass Organization
Society for Ecological Restoration International

LANGUAGES

English (fluent), Portuguese (fluent) and Spanish (conversational)